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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,221	06/30/2003	Oh-Sung Song	SEC.559RE	1783

20987 7590 10/26/2006

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EXAMINER	
FOURSON III, GEORGE R	

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 10/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/608,221	SONG ET AL.	
	Examiner	Art Unit	
	George Fourson	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 17-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-8* is/are allowed.

6)☒ Claim(s) *9 and 17-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/19/06 has been entered.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 9 and 17-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Fulford, Jr. et al, Sheng et al, Tsai et al and Fann-Mei et al, newly cited.

Fulford, Jr. et al discloses forming polysilicon gate 12 over gate insulating layer 20 on semiconductor substrate 22, injecting low concentration of impurity ions 21 to form LDD regions 23, forming oxide buffer layer 24 over the substrate, forming sidewall spacers 28 on a portion of the buffer layer using anisotropic etching, injecting a high concentration of impurity ions 32 to form heavily doped regions 34 having the same conductivity type as regions 23 wherein regions 23 and 34 form source/drain structures, removing an exposed portion of buffer layer to expose the substrate and performing a SALICIDE process which, by definition, involves deposition of a metal layer and subsequent heating to form a silicide by reaction of the metal layer and the portions of the substrate and gate contacting the metal layer (figures 1-6 and col.8, lines 45-55). The buffer layer is disclosed to prevent contamination (col.6, line 31).

The reference does not clearly disclose the conductivity type of the substrate, the formation of the buffer layer by deposition or the identity of the metal layer being a transition metal layer.

In a similar process wherein an exposed portion of buffer layer 50 is removed to perform a SALICIDE process Tsai et al discloses the substrate being of opposite conductivity type to that of the source/drain regions and use of Ti, Co or Ni as the silicide forming metal layer 80 (fig.8) and performing the SALICIDE process at 400-700°C.

Sheng et al discloses formation of oxide buffer layer 24 by either of oxidation or by deposition to prevent contamination (col.4, lines 60-68).

It would have been obvious to one of ordinary skill in the art to combine the teachings of Fulford, Jr. et al and Tsai et al to enable the disclosed formation of the transistor of Fulford, Jr. et al having the structure of a depletion mode transistor and to enable the disclosed salicide process to be performed according to the teachings of Tsai et al. It would have been obvious to one of ordinary skill in the art to combine the teachings of Fulford, Jr. et al and Sheng et al to enable the disclosed formation of buffer layer 24 of Fulford, Jr. et al to be performed according to the teachings of Sheng et al such that contamination is mitigated.

One of ordinary skill in the art would have been led to the recited thickness of the oxide buffer layer through routine experimentation to provide the desired degree of protection from contamination. Further, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose these particular dimensions because applicant has not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, In re Rose, 220 F.2d 459, 105 USPQ 237

(CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). See also MPEP 2144.04(IV)(B).

The process of the combination does not include a two-step annealing process to accomplish the SALICIDE process. Fann-Mei et al disclose a two-step annealing process to form a cobalt silicide including a first anneal at 400-600°C and a second anneal at 750°C to overcome the oxidizing liability of Co (abstract). It would have been obvious to one of ordinary skill in the art to combine the teachings of Fann-Mei et al with those of Fulford Jr., et al and Tsai et al to enable the Co silicide formation to be performed according to the teachings of Fann-Mei and furthermore to overcome the oxidizing liability of Co as disclosed by Fann-Mei et al.

The examiner takes official notice that formation of cobalt layers by plasma CVD was known prior to applicant's invention. It would have been obvious to one of ordinary skill in the art to combine the known teachings with those of Fulford et al and Tsai et al to enable the disclosed cobalt deposition step to be performed according to the known teachings.

The examiner takes official notice that formation of n-type regions and p-type regions by implantation of P and B, respectively, was known prior to applicant's invention. It would have been obvious to one of ordinary skill in the art to combine the known teachings with those of Fulford et al to enable the disclosed LDD implantation step to be performed according to the known teachings.

The examiner takes official notice that formation of n-type regions and p-type regions by implantation of As and BF_2, respectively, was known prior to applicant's invention. It would have been obvious to one of ordinary skill in the art to combine the known teachings with those of Fulford et al to enable the disclosed source/drain implantation step to be performed according to the known teachings.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Fourson whose telephone number is (571)272-1860272-1860. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

George Fourson
Primary Examiner
Art Unit 2823

GFourson
October 18, 2006